WHAT IS CLAIMED IS:

1. A moving picture encoding system for encoding moving picture sequences with respect to each object, comprising:

a coding means for encoding object picture data consisting of time series sequences of video object planes (VOPs), each of which is a picture image of the object at a point of time, and shape information data indicating the shape of the object in each VOP while conducting bit rate control so that the number of generated bits for each VOP meets a target bit number, and outputting coding information including a quantization parameter used in encoding and the generated bit number along with obtained bit streams;

an area calculating means for calculating the area of the object in each VOP based on the shape information data, and outputting the result as area data;

a predictive area calculating parameter extracting means for obtaining a function that indicates temporal variations in the area of the object based on the history of the area data, and outputting a parameter specifying the function or a predictive value of the area obtained by the function as a predictive area calculating parameter;

a bit number model parameter calculating means for calculating a parameter used in modeling the generated bit number per unit area of the object based on the coding information, the generated bit number and the area data, and outputting the result as a bit number model parameter;

a predictive bit number calculating parameter extracting means for obtaining a function that indicates temporal variations in the bit number model parameter based on the history of the bit number model parameter, and outputting a parameter specifying the function or a predictive value of the bit number model parameter obtained by the function as a predictive bit number calculating parameter; and

30   a target bit number calculating means which performs a series of processes: calculating an uncoded VOP allocatable bit number that is the total number of allocatable bits for uncoded VOPs in a certain period of time based on allocatable bit number information indicating the total number of allocatable bits for the VOPs in the certain period of time and

35   the number of generated bits for the encoded VOPs in the certain period of time, estimating the number of generated bits for the uncoded VOPs based on the predictive area calculating parameter and the predictive bit number calculating parameter, allocating the uncoded VOP allocatable bit number, calculating a target bit number for the next VOP to be

40   encoded, and outputting the target bit number; sequentially for each of VOPs in the certain period of time.

2.   A moving picture encoding system for encoding moving picture sequences with respect to each object, comprising:

      a storing means for temporarily storing object picture data consisting of time series sequences of video object planes (VOPs), each of

5   which is a picture image of the object at a point of time, and shape information data indicating the shape of the object in each VOP;

      a coding means which reads the object picture data and shape information data out of the storing means, encodes the data while conducting bit rate control so that the number of generated bits for each

10   VOP meets a target bit number, and outputs coding information including a quantization parameter used in encoding and the generated bit number along with obtained bit streams;

      an area calculating means for calculating the area of the object in each VOP based on the shape information data, and outputting the

15   result as area data;

      a bit number model parameter calculating means for calculating a parameter used in modeling the generated bit number per

unit area of the object based on the coding information, the generated bit number and the area data, and outputting the result as a bit number model parameter;

a predictive bit number calculating parameter extracting means for obtaining a function that indicates temporal variations in the bit number model parameter based on the history of the bit number model parameter, and outputting a parameter specifying the function or a predictive value of the bit number model parameter obtained by the function as a predictive bit number calculating parameter; and

a target bit number calculating means which performs a series of processes: calculating an uncoded VOP allocatable bit number that is the total number of allocatable bits for uncoded VOPs in a certain period of time based on allocatable bit number information indicating the total number of allocatable bits for the VOPs in the certain period of time and the number of generated bits for the encoded VOPs in the certain period of time, estimating the number of generated bits for the uncoded VOPs based on the area data and the predictive bit number calculating parameter, allocating the uncoded VOP allocatable bit number, calculating a target bit number for the next VOP to be encoded, and outputting the target bit number; sequentially for each of VOPs in the certain period of time.

3.   The moving picture encoding system claimed in claim 1, wherein a moving picture sequence may includes a plurality of objects.

4.   The moving picture encoding system claimed in claim 2, wherein a moving picture sequence may includes a plurality of objects.

5.   A moving picture encoding system for encoding each frame of moving picture sequences while conducting bit rate control with

respect to each section of the frame, comprising:

a coding means which is supplied with picture data, section information data indicating the sections in each frame of the picture data and a target bit number for each section, encodes the data with respect to each section while conducting bit rate control so that the number of generated bits for each section meets the target bit number, and outputs coding information including a quantization parameter used in encoding and the generated bit number along with obtained bit streams;

an area calculating means for calculating the area of the section in each frame based on the section information data, and outputting the result as area data;

a predictive area calculating parameter extracting means for obtaining a function that indicates temporal variations in the area of the section based on the history of the area data, and outputting a parameter specifying the function or a predictive value of the area obtained by the function as a predictive area calculating parameter;

a bit number model parameter calculating means for calculating a parameter used in modeling the generated bit number per unit area of the section based on the coding information, the generated bit number and the area data, and outputting the result as a bit number model parameter;

a predictive bit number calculating parameter extracting means for obtaining a function that indicates temporal variations in the bit number model parameter based on the history of the bit number model parameter, and outputting a parameter specifying the function or a predictive value of the bit number model parameter obtained by the function as a predictive bit number calculating parameter; and

a target bit number calculating means which performs a series of processes: calculating an uncoded frame allocatable bit number that is the total number of allocatable bits for uncoded frames in a certain

period of time based on allocatable bit number information indicating the total number of allocatable bits for the frames in the certain period of

35   time and the number of generated bits for the encoded frames in the certain period of time, estimating the number of generated bits for each section in the uncoded frames based on the predictive area calculating parameter and the predictive bit number calculating parameter, allocating the uncoded frame allocatable bit number, calculating a target

40   bit number for each section in the next frame to be encoded, and outputting the target bit number; sequentially for each of frames in the certain period of time.

    6.   A moving picture encoding system for encoding each frame of moving picture sequences while conducting bit rate control with respect to each section of the frame, comprising:

        a storing means for temporarily storing picture data, section

5   information data indicating the sections in each frame of the picture data;

        a coding means which reads the picture data and section information data out of the storing means, encodes the data with respect to each section while conducting bit rate control so that the number of

10   generated bits for each section meets a target bit number for the section, and outputs coding information including a quantization parameter used in encoding and the generated bit number along with obtained bit streams;

        an area calculating means for calculating the area of the

15   section in each frame based on the section information data, and outputting the result as area data;

        a bit number model parameter calculating means for calculating a parameter used in modeling the generated bit number per unit area of the section based on the coding information, the generated

20   bit number and the area data, and outputting the result as a bit number model parameter;

a predictive bit number calculating parameter extracting means for obtaining a function that indicates temporal variations in the bit number model parameter based on the history of the bit number

25   model parameter, and outputting a parameter specifying the function or a predictive value of the bit number model parameter obtained by the function as a predictive bit number calculating parameter; and

a target bit number calculating means which performs a series of processes: calculating an uncoded frame allocatable bit number that is

30   the total number of allocatable bits for uncoded frames in a certain period of time based on allocatable bit number information indicating the total number of allocatable bits for the frames in the certain period of time and the number of generated bits for the encoded frames in the certain period of time, estimating the number of generated bits for each

35   section in the uncoded frames based on the area data and the predictive bit number calculating parameter, allocating the uncoded frame allocatable bit number, calculating a target bit number for each section in the next frame to be encoded, and outputting the target bit number; sequentially for each of frames in the certain period of time.

7.   The moving picture encoding system claimed in claim 1, wherein:

the bit number model parameter is a complexity index per unit area of the picture; and

5   the target bit number calculating means calculates the target bit number based on a product of a predictive value of the complexity index and a predictive value of the area data.

8.   The moving picture encoding system claimed in claim 5,

wherein:

the bit number model parameter is a complexity index per unit area of the picture; and

5   the target bit number calculating means calculates the target bit number based on a product of a predictive value of the complexity index and a predictive value of the area data.

9.   The moving picture encoding system claimed in claim 2, wherein:

the bit number model parameter is a complexity index per unit area of the picture; and

5   the target bit number calculating means calculates the target bit number based on a product of a predictive value of the complexity index and the area data.

10.   The moving picture encoding system claimed in claim 6, wherein:

the bit number model parameter is a complexity index per unit area of the picture; and

5   the target bit number calculating means calculates the target bit number based on a product of a predictive value of the complexity index and the area data.

11.   The moving picture encoding system claimed in claim 1, wherein:

the bit number model parameter calculating means calculates the bit number model parameter with respect to each VOP type; and

5   the predictive bit number calculating parameter extracting means calculates the predictive bit number calculating parameter with respect to each VOP type.

12. The moving picture encoding system claimed in claim 2, wherein:

the bit number model parameter calculating means calculates the bit number model parameter with respect to each VOP type; and

5   the predictive bit number calculating parameter extracting means calculates the predictive bit number calculating parameter with respect to each VOP type.

13. The moving picture encoding system claimed in claim 5, wherein:

the bit number model parameter calculating means calculates the bit number model parameter with respect to each frame type; and

5   the predictive bit number calculating parameter extracting means calculates the predictive bit number calculating parameter with respect to each frame type.

14. The moving picture encoding system claimed in claim 6, wherein:

the bit number model parameter calculating means calculates the bit number model parameter with respect to each frame type; and

5   the predictive bit number calculating parameter extracting means calculates the predictive bit number calculating parameter with respect to each frame type.

15. The moving picture encoding system claimed in claim 3, wherein a constant which can make a variation in quantization fineness among objects is used when the target bit number is calculated.

16. The moving picture encoding system claimed in claim 4,

wherein a constant which can make a variation in quantization fineness among objects is used when the target bit number is calculated.

17.   The moving picture encoding system claimed in claim 5, wherein a constant which can make a variation in quantization fineness among sections is used when the target bit number is calculated.

18.   The moving picture encoding system claimed in claim 6, wherein a constant which can make a variation in quantization fineness among sections is used when the target bit number is calculated.

19.   A moving picture encoding method for encoding moving picture sequences with respect to each object, comprising the steps of:

calculating an uncoded VOP allocatable bit number that is the total number of allocatable bits for uncoded VOPs in a certain period of time by subtracting the number of generated bits for the encoded VOPs in the certain period of time from the total number of allocatable bits for the VOPs in the certain period of time;

estimating the number of generated bits for all the uncoded VOPs;

10   calculating a target bit number for the next VOP to be encoded by allocating the uncoded VOP allocatable bit number; and

encoding the VOP; sequentially for each of VOPs in the certain period of time.

20.   A moving picture encoding method for encoding each frame of moving picture sequences while conducting bit rate control with respect to each section of the frame, comprising the steps of:

calculating an uncoded frame allocatable bit number that is

5   the total number of allocatable bits for uncoded frames in a certain

period of time by subtracting the number of generated bits for the encoded frames in the certain period of time from the total number of allocatable bits for the frames in the certain period of time;

estimating the number of generated bits for all the sections in

10 the uncoded frames;

calculating a target bit number for each section in the next frame to be encoded by allocating the uncoded frame allocatable bit number; and

encoding the frame; sequentially for each of frames in the

15 certain period of time.

21. The moving picture encoding method claimed in claim 19, wherein a constant which can make a variation in quantization fineness among objects is used when the target bit number is calculated.

22. The moving picture encoding method claimed in claim 20, wherein a constant which can make a variation in quantization fineness among sections is used when the target bit number is calculated.

23. A program for conducting a computer to execute the moving picture encoding method claimed in claim 19.

24. A program for conducting a computer to execute the moving picture encoding method claimed in claim 20.